What is claimed is:

1. A method for video analysis and content extraction, comprising:

scene analysis processing of at least one video input stream;

object detection and tracking for each scene, and;

split and merge behavior analysis for event understanding.

2. The method as claimed in claim 1, further comprising:

storing behavior analysis results.

3. The method as claimed in claim 2, wherein the behavior analysis results are stored in a database.

4. The method as claimed in claim 2, wherein the behavior analysis results are stored in at least one video output stream.

5. The method as claimed in claim 1, wherein the scene analysis processing further includes:

scene change detection.

6. The method as claimed in claim 1, wherein the scene analysis processing further includes:

camera calibration.

7. The method as claimed in claim 1, wherein the scene analysis processing further includes:

scene geometry estimation.

8. The method as claimed in claim 1, wherein the object detection and tracking step further comprises:

identifying a split behavior.

9. The method as claimed in claim 8, wherein the split behavior includes an object splitting into two or more objects.

10. The method as claimed in claim 1, wherein the object detection and tracking step further comprises:

identifying a merge behavior.

11. The method as claimed in claim 10, wherein the merge behavior includes two or more objects merging into a single object.

12. The method as claimed in claim 1, wherein the object detection and tracking step further comprises identifying zero or more split behaviors and zero or more merge behaviors.

13. The method as claimed in claim 12, wherein the split behaviors and merge behaviors are combined to model complex behaviors.

14. The method as claimed in claim 13, wherein the complex behaviors include package drop off, package exchange, crowd formation, crowd dispersal, people entering vehicles, and people exiting vehicles.

15. The method as claimed in claim 1, wherein the behavior analysis step further comprises generating a directed graph including zero or more split behavior states and zero or more merge behavior states.

16. The method as claimed in claim 15, wherein the behavior analysis step further comprises generating a hidden Markov model including the directed graph.

17. The method as claimed in claim 4, wherein the results are stored as metadata.

18. The method as claimed in claim 8, wherein the split behavior identification applies the formula:

$$\hat{A}_i^{k+1} \cap (A_i^{k+1} \cup A_j^{k+1}) \neq \emptyset \text{ and}$$
$$m(\hat{A}_i^{k+1}) = r \cdot m(A_i^{k+1} \cup A_j^{k+1})$$

19. The method as claimed in claim 10, wherein the merge behavior identification applies the formula:

$$A_l^{k+1} \cap (\hat{A}_i^{k+1} \cup \hat{A}_j^{k+1}) \neq \emptyset \text{ and}$$
$$m(A_l^{k+1}) = r \cdot m(\hat{A}_i^{k+1} \cup \hat{A}_j^{k+1})$$

20. The method as claimed in claim 13, wherein the complex behaviors are categorized as one of simple, compound, and chain behaviors.

21. An apparatus for video content analysis comprising:

a processor for receiving and transmitting data; and

a memory coupled to the processor, the memory having stored therein instructions causing the processor to perform scene analysis processing of at least one video input stream, detect and track objects for each scene, and analyze split and merge behaviors for event understanding.

22. The apparatus as claimed in claim 21, wherein the memory further comprises instructions causing the processor to store analysis results in at least one video output stream.

23. The apparatus as claimed in claim 22, wherein the memory further comprises instructions causing the processor to store the results as metadata.

24. The apparatus as claimed in claim 21, wherein the memory further comprises instructions causing the processor to perform at least one of scene change detection, camera calibration, and scene geometry estimation.

25. The apparatus as claimed in claim 21, wherein the instructions causing the processor to detect and track objects for each scene further comprises identifying zero or more split behaviors and zero or more merge behaviors.

26. The apparatus as claimed in claim 25, wherein the instructions causing the processor to identify zero or more split behaviors and zero or more merge behaviors further comprises combining the split and merge behaviors to model complex behaviors.

27. The apparatus as claimed in claim 21, wherein the instructions causing the processor to analyze split and merge behaviors further comprises generating a directed graph including zero or more split behavior states and zero or more merge behavior states.

28. The apparatus as claimed in claim 27, wherein the instructions causing the processor to analyze split and merge behaviors further comprises generating a hidden Markov model including the directed graph.

29. The apparatus as claimed in claim 25, wherein the instructions causing the processor to identify zero or more split behaviors includes the formula:

$$\hat{A}_i^{k+1} \cap (A_i^{k+1} \cup A_j^{k+1}) \neq \emptyset \text{ and}$$
$$m(\hat{A}_i^{k+1}) = r \cdot m(A_i^{k+1} \cup A_j^{k+1})$$

30. The apparatus as claimed in claim 25, wherein the instructions causing the processor to identify zero or more merge behaviors includes the formula:

$$A_l^{k+1} \cap (\hat{A}_i^{k+1} \cup \hat{A}_j^{k+1}) \neq \emptyset \text{ and}$$
$$m(A_l^{k+1}) = r \cdot m(\hat{A}_i^{k+1} \cup \hat{A}_j^{k+1})$$